

$f_0(980)$ $I^G(J^{PC}) = 0^+(0^{++})$

See also the minireview on scalar mesons under $f_0(500)$. (See the index for the page number.)

 $f_0(980)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
990 ±20 OUR ESTIMATE				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
989.9 ± 0.4	706	ABLIKIM	12E BES3	$J/\psi \rightarrow \gamma 3\pi$
1003 +5 -27		1,2 GARCIA-MAR..11	RVUE	Compilation
996 ± 7		1,3 GARCIA-MAR..11	RVUE	Compilation
996 +4 -14		4 MOUSSALLAM11	RVUE	Compilation
981 ± 43		5 MENNESSIER 10	RVUE	Compilation
1030 +30 -10		6 ANISOVICH 09	RVUE	$0.0 \bar{p}p, \pi N$
977 +11 -9 ± 1	44	7 ECKLUND	09 CLEO	$4.17 e^+ e^- \rightarrow D_s^- D_s^{*+} + c.c.$
982.2 ± 1.0 +8.1 -8.0		8 UEHARA	08A BELL	$10.6 e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$
976.8 ± 0.3 +10.1 -0.6	64k	9 AMBROSINO	07 KLOE	$1.02 e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
984.7 ± 0.4 +2.4 -3.7	64k	10 AMBROSINO	07 KLOE	$1.02 e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
973 ± 3	262 ± 30	11 AUBERT	07AKBABR	$10.6 e^+ e^- \rightarrow \phi \pi^+ \pi^- \gamma$
970 ± 7	54 ± 9	11 AUBERT	07AKBABR	$10.6 e^+ e^- \rightarrow \phi \pi^0 \pi^0 \gamma$
953 ± 20	2.6k	12 BONVICINI	07 CLEO	$D^+ \rightarrow \pi^- \pi^+ \pi^+$
985.6 +1.2 +1.1 -1.5 -1.6		13 MORI	07 BELL	$10.6 e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$
983.0 ± 0.6 +4.0 -3.0		14 AMBROSINO	06B KLOE	$1.02 e^+ e^- \rightarrow \pi^+ \pi^- \gamma$
977.3 ± 0.9 +3.7 -4.3		15 AMBROSINO	06B KLOE	$1.02 e^+ e^- \rightarrow \pi^+ \pi^- \gamma$
950 ± 9	4286	16 GARMASH	06 BELL	$B^+ \rightarrow K^+ \pi^+ \pi^-$
965 ± 10		17 ABLIKIM	05 BES2	$J/\psi \rightarrow \phi \pi^+ \pi^-, \phi K^+ K^-$
1031 ± 8		18 ANISOVICH	03 RVUE	
1037 ± 31		TIKHOMIROV	03 SPEC	$40.0 \pi^- C \rightarrow K_S^0 K_S^0 K_L^0 X$
973 ± 1	2438	19 ALOISIO	02D KLOE	$e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
977 ± 3 ± 2	848	20 AITALA	01A E791	$D_s^+ \rightarrow \pi^- \pi^+ \pi^+$
969.8 ± 4.5	419	21 ACHASOV	00H SND	$e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
985 +16 -12	419	22,23 ACHASOV	00H SND	$e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
976 ± 5 ± 6		24 AKHMETSHIN 99B	CMD2	$e^+ e^- \rightarrow \pi^+ \pi^- \gamma$
977 ± 3 ± 6	268	24 AKHMETSHIN 99C	CMD2	$e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
975 ± 4 ± 6		25 AKHMETSHIN 99C	CMD2	$e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$
975 ± 4 ± 6		26 AKHMETSHIN 99C	CMD2	$e^+ e^- \rightarrow \pi^+ \pi^- \gamma, \pi^0 \pi^0 \gamma$
985 ± 10		BARBERIS	99 OMEG	$450 pp \rightarrow p_s p_f K^+ K^-$
982 ± 3		BARBERIS	99B OMEG	$450 pp \rightarrow p_s p_f \pi^+ \pi^-$
982 ± 3		BARBERIS	99C OMEG	$450 pp \rightarrow p_s p_f \pi^0 \pi^0$
987 ± 6 ± 6		27 BARBERIS	99D OMEG	$450 pp \rightarrow K^+ K^-, \pi^+ \pi^-$
989 ± 15		BELLAZZINI	99 GAM4	$450 pp \rightarrow pp \pi^0 \pi^0$
991 ± 3		28 KAMINSKI	99 RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}, \sigma\sigma$
~ 980		28 OLLER	99 RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}$
~ 993.5		OLLER	99B RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}$
~ 987		28 OLLER	99C RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}, \eta\eta$
957 ± 6		29 ACKERSTAFF	98Q OPAL	$Z \rightarrow f_0 X$
960 ± 10		ALDE	98 GAM4	
1015 ± 15		28 ANISOVICH	98B RVUE	Compilation

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1008		30	LOCHER	98	RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}$
955 ± 10		29	ALDE	97	GAM2	$450 \bar{p}p \rightarrow \bar{p}p\pi^0\pi^0$
994 ± 9		31	BERTIN	97C	OBLX	$0.0 \bar{p}p \rightarrow \pi^+\pi^-\pi^0$
993.2 $\pm 6.5 \pm 6.9$		32	ISHIDA	96	RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}$
1006			TORNQVIST	96	RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}, K\pi,$ $\eta\pi$
997 ± 5	3k	33	ALDE	95B	GAM2	$38 \pi^- p \rightarrow \pi^0\pi^0 n$
960 ± 10	10k	34	ALDE	95B	GAM2	$38 \pi^- p \rightarrow \pi^0\pi^0 n$
994 ± 5			AMSLER	95B	CBAR	$0.0 \bar{p}p \rightarrow 3\pi^0$
~ 996		35	AMSLER	95D	CBAR	$0.0 \bar{p}p \rightarrow \pi^0\pi^0\pi^0,$ $\pi^0\eta\eta, \pi^0\pi^0\eta$
987 ± 6		36	ANISOVICH	95	RVUE	
1015			JANSSEN	95	RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}$
983		37	BUGG	94	RVUE	$\bar{p}p \rightarrow \eta 2\pi^0$
973 ± 2		38	KAMINSKI	94	RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}$
988		39	ZOU	94B	RVUE	
988 ± 10		40	MORGAN	93	RVUE	$\pi\pi(K\bar{K}) \rightarrow \pi\pi(K\bar{K}),$ $J/\psi \rightarrow \phi\pi\pi(K\bar{K}),$ $D_s \rightarrow \pi(\pi\pi)$
971.1 ± 4.0		29	AGUILAR-...	91	EHS	$400 \bar{p}p$
979 ± 4		41	ARMSTRONG	91	OMEG	$300 \bar{p}p \rightarrow \bar{p}p\pi\pi,$ $\bar{p}pKK$
956 ± 12			BREAKSTONE	90	SFM	$\bar{p}p \rightarrow \bar{p}p\pi^+\pi^-$
959.4 ± 6.5		29	AUGUSTIN	89	DM2	$J/\psi \rightarrow \omega\pi^+\pi^-$
978 ± 9		29	ABACHI	86B	HRS	$e^+e^- \rightarrow \pi^+\pi^- X$
985.0 ± 9.0 -39.0			ETKIN	82B	MPS	$23 \pi^- p \rightarrow n2K_S^0$
974 ± 4		41	GIDAL	81	MRK2	$J/\psi \rightarrow \pi^+\pi^- X$
975		42	ACHASOV	80	RVUE	
986 ± 10		41	AGUILAR-...	78	HBC	$0.7 \bar{p}p \rightarrow K_S^0 K_S^0$
969 ± 5		41	LEEPER	77	ASPK	$2-2.4 \pi^- p \rightarrow$ $\pi^+\pi^- n, K^+K^- n$
987 ± 7		41	BINNIE	73	CNTTR	$\pi^- p \rightarrow nMM$
1012 ± 6		43	GRAYER	73	ASPK	$17 \pi^- p \rightarrow \pi^+\pi^- n$
1007 ± 20		43	HYAMS	73	ASPK	$17 \pi^- p \rightarrow \pi^+\pi^- n$
997 ± 6		43	PROTOPOP...	73	HBC	$7 \pi^+ p \rightarrow \pi^+ p\pi^+\pi^-$

1 Quoted number refers to real part of pole position.

2 Analytic continuation using Roy equations. Uses the K_{e4} data of BATLEY 10C and the $\pi N \rightarrow \pi\pi N$ data of HYAMS 73, GRAYER 74, and PROTOPOPESCU 73.

3 Analytic continuation using GKPY equations. Uses the K_{e4} data of BATLEY 10C and the $\pi N \rightarrow \pi\pi N$ data of HYAMS 73, GRAYER 74, and PROTOPOPESCU 73.

4 Pole position. Used Roy equations.

5 Average of the analyses of three data sets in the K-matrix model. Uses the data of BATLEY 08A, HYAMS 73, and GRAYER 74, partially of COHEN 80 or ETKIN 82B.

6 On sheet II in a 2-pole solution. The other pole is found on sheet III at (850–100) MeV

7 Using a relativistic Breit-Wigner function and taking into account the finite D_s mass.

8 Breit-Wigner mass. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0} K\bar{K}/g_{f_0}\pi\pi = 0$.

9 In the kaon-loop fit.

10 In the no-structure fit.

11 Systematic errors not estimated.

12 FLATTE 76 parameterization. $g_{f_0}\pi\pi = 329 \pm 96 \text{ MeV}/c^2$ assuming $g_{f_0} K\bar{K}/g_{f_0}\pi\pi = 2$.

13 Breit-Wigner mass. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0} K\bar{K}/g_{f_0}\pi\pi = 4.21 \pm 0.25 \pm 0.21$ from ABLIKIM 05.

14 In the kaon-loop fit following formalism of ACHASOV 89.

15 In the no-structure fit assuming a direct coupling of ϕ to f_0 .

16 FLATTE 76 parameterization. Supersedes GARMASH 05.

17 FLATTE 76 parameterization, $g_{f_0} K\bar{K}/g_{f_0}\pi\pi = 4.21 \pm 0.25 \pm 0.21$.

18 K-matrix pole from combined analysis of $\pi^- p \rightarrow \pi^0\pi^0 n$, $\pi^- p \rightarrow K\bar{K}n$, $\pi^+\pi^- \rightarrow \pi^+\pi^-$, $\bar{p}p \rightarrow \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$, $\pi^+\pi^-\pi^0$, $K^+K^-\pi^0$, $K_S^0 K_S^0\pi^0$, $K^+K_S^0\pi^-$ at rest, $\bar{p}n \rightarrow \pi^-\pi^-\pi^+$, $K_S^0 K^- \pi^0$, $K_S^0 K_S^0\pi^-$ at rest.

19 From the negative interference with the $f_0(500)$ meson of AITALA 01B using the ACHASOV 89 parameterization for the $f_0(980)$, a Breit-Wigner for the $f_0(500)$, and ACHASOV 01F for the $\rho\pi$ contribution.

20 Coupled-channel Breit-Wigner, couplings $g_\pi = 0.09 \pm 0.01 \pm 0.01$, $g_K = 0.02 \pm 0.04 \pm 0.03$.

21 Supersedes ACHASOV 98I. Using the model of ACHASOV 89.

22 Supersedes ACHASOV 98I.

23 In the “narrow resonance” approximation.

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NODE=M003M;LINKAGE=V8

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- 24 Assuming $\Gamma(f_0) = 40$ MeV.
 25 From a narrow pole fit taking into account $f_0(980)$ and $f_0(1200)$ intermediate mechanisms.
 26 From the combined fit of the photon spectra in the reactions $e^+ e^- \rightarrow \pi^+ \pi^- \gamma$, $\pi^0 \pi^0 \gamma$.
 27 Supersedes BARBERIS 99 and BARBERIS 99B
 28 T-matrix pole.
 29 From invariant mass fit.
 30 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(1039 - 93i)$ MeV.
 31 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(963 - 29i)$ MeV.
 32 Reanalysis of data from HYAMS 73, GRAYER 74, SRINIVASAN 75, and ROSSELET 77 using the interfering amplitude method.
 33 At high $|t|$.
 34 At low $|t|$.
 35 On sheet II in a 4-pole solution, the other poles are found on sheet III at $(953 - 55i)$ MeV and on sheet IV at $(938 - 35i)$ MeV.
 36 Combined fit of ALDE 95B, ANISOVICH 94, AMSLER 94D.
 37 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(996 - 103i)$ MeV.
 38 From sheet II pole position.
 39 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(797 - 185i)$ MeV and can be interpreted as a shadow pole.
 40 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(978 - 28i)$ MeV.
 41 From coupled channel analysis.
 42 Coupled channel analysis with finite width corrections.
 43 Included in AGUILAR-BENITEZ 78 fit.

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OCCUR=2

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OCCUR=2

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT	
40 to 100 OUR ESTIMATE					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
9.5 ± 1.1	706	ABLIKIM	12E	BES3 $J/\psi \rightarrow \gamma 3\pi$	
42 + 20 - 16		1,2 GARCIA-MAR..11	RVUE	Compilation	
50 + 20 - 12		2,3 GARCIA-MAR..11	RVUE	Compilation	
48 + 22 - 6		4 MOUSSALLAM11	RVUE	Compilation	
36 ± 22		5 MENNESSIER 10	RVUE	Compilation	
70 + 20 - 32		6 ANISOVICH 09	RVUE	0.0 $\bar{p}p, \pi N$	
91 + 30 - 22 ± 3	44	7 ECKLUND	09	CLEO $4.17 e^+ e^- \rightarrow D_s^- D_s^{*+} + c.c.$	
66.9 ± 2.2 + 17.6 - 12.5		8 UEHARA	08A	BELL $10.6 e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$	
65 ± 13	262 ± 30	9 AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow \phi \pi^+ \pi^- \gamma$	
81 ± 21	54 ± 9	9 AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow \phi \pi^0 \pi^0 \gamma$	
51.3 + 20.8 + 13.2 - 17.7 - 3.8		10 MORI	07	BELL $10.6 e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$	
61 ± 9 + 14 - 8	2584	11 GARMASH	05	BELL $B^+ \rightarrow K^+ \pi^+ \pi^-$	
64 ± 16		12 ANISOVICH	03	RVUE	
121 ± 23		TIKHOMIROV 03	SPEC	$40.0 \pi^- C \rightarrow K_S^0 K_S^0 K_L^0 X$	
~ 70		13 BRAMON	02	RVUE $1.02 e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$	
44 ± 2 ± 2	848	14 AITALA	01A	E791 $D_s^+ \rightarrow \pi^- \pi^+ \pi^+$	
201 ± 28	419	15 ACHASOV	00H	SND $e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$	
122 ± 13	419	16,17 ACHASOV	00H	SND $e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$	
56 ± 20		18 AKHMETSHIN 99C	CMD2	$e^+ e^- \rightarrow \pi^0 \pi^0 \gamma$	
65 ± 20		BARBERIS	99	OMEG $450 pp \rightarrow p_s p_f K^+ K^-$	
80 ± 10		BARBERIS	99B	OMEG $450 pp \rightarrow p_s p_f \pi^+ \pi^-$	
80 ± 10		BARBERIS	99C	OMEG $450 pp \rightarrow p_s p_f \pi^0 \pi^0$	

48 ± 12 ± 8	19 BARBERIS BELLAZZINI ~28 ~25 ~14 70 ± 20 86 ± 16 54 69 ± 15 38 ± 20 ~100 34	99D OMEG 450 $pp \rightarrow K^+ K^-$, $\pi^+ \pi^-$ 99 GAM4 450 $pp \rightarrow pp\pi^0\pi^0$ 99 RVUE $\pi\pi \rightarrow \pi\pi, K\bar{K}, \sigma\sigma$ 99 RVUE $\pi\pi \rightarrow \pi\pi, K\bar{K}$ 99B RVUE $\pi\pi \rightarrow \pi\pi, K\bar{K}$ 98 GAM4 98B RVUE Compilation 98 RVUE $\pi\pi \rightarrow \pi\pi, K\bar{K}$ 97 GAM2 450 $pp \rightarrow pp\pi^0\pi^0$ 97C OBLX 0.0 $\bar{p}p \rightarrow \pi^+\pi^-\pi^0$ 96 RVUE $\pi\pi \rightarrow \pi\pi, K\bar{K}$ 96 RVUE $\pi\pi \rightarrow \pi\pi, K\bar{K}, K\pi, \eta\pi$		
48 ± 10	3k	25 ALDE 10k	95B GAM2 38 $\pi^- p \rightarrow \pi^0\pi^0 n$ 26 ALDE 95B GAM2 38 $\pi^- p \rightarrow \pi^0\pi^0 n$ AMSLER 95B CBAR 0.0 $\bar{p}p \rightarrow 3\pi^0$ 27 AMSLER 95D CBAR 0.0 $\bar{p}p \rightarrow \pi^0\pi^0\pi^0, \pi^0\eta\eta, \pi^0\pi^0\eta$	OCCUR=2
95 ± 20				
26 ± 10				
~112				
80 ± 12		28 ANISOVICH JANSSEN 29 BUGG 29 ± 2 46 48 ± 12	95 RVUE 95 RVUE $\pi\pi \rightarrow \pi\pi, K\bar{K}$ 94 RVUE $\bar{p}p \rightarrow \eta 2\pi^0$ 30 KAMINSKI 94 RVUE $\pi\pi \rightarrow \pi\pi, K\bar{K}$ 31 ZOU 94B RVUE 32 MORGAN 93 RVUE $\pi\pi(K\bar{K}) \rightarrow \pi\pi(K\bar{K}), J/\psi \rightarrow \phi\pi\pi(K\bar{K}), D_s \rightarrow \pi(\pi\pi)$	
37.4 ± 10.6		22 AGUILAR-...	91 EHS 400 pp	
72 ± 8		33 ARMSTRONG 91	OMEG 300 $pp \rightarrow pp\pi\pi, ppK\bar{K}$	
110 ± 30		BREAKSTONE 90	SFM $pp \rightarrow pp\pi^+\pi^-$	
29 ± 13		22 ABACHI 86B	HRS $e^+ e^- \rightarrow \pi^+\pi^- X$	
120 ± 281 ± 20		ETKIN 82B	MPS 23 $\pi^- p \rightarrow n2K_S^0$	
28 ± 10		33 GIDAL 81	MRK2 $J/\psi \rightarrow \pi^+\pi^- X$	
70 to 300		34 ACHASOV 80	RVUE	
100 ± 80		35 AGUILAR-...	78 HBC 0.7 $\bar{p}p \rightarrow K_S^0 K_S^0$	
30 ± 8		33 LEEPER 77	ASPK 2-2.4 $\pi^- p \rightarrow \pi^+\pi^- n, K^+K^-n$	
48 ± 14		33 BINNIE 73	CNTR $\pi^- p \rightarrow nMM$	
32 ± 10		36 GRAYER 73	ASPK 17 $\pi^- p \rightarrow \pi^+\pi^- n$	
30 ± 10		36 HYAMS 73	ASPK 17 $\pi^- p \rightarrow \pi^+\pi^- n$	
54 ± 16		36 PROTOPOP... 73	HBC 7 $\pi^+ p \rightarrow \pi^+\pi^+\pi^-$	

1 Analytic continuation using Roy equations. Uses the K_{e4} data of BATLEY 10C and the $\pi N \rightarrow \pi\pi N$ data of HYAMS 73, GRAYER 74, and PROTOPOPESCU 73.

2 Quoted number refers to twice imaginary part of pole position.

3 Analytic continuation using GKPY equations. Uses the K_{e4} data of BATLEY 10C and the $\pi N \rightarrow \pi\pi N$ data of HYAMS 73, GRAYER 74, and PROTOPOPESCU 73.

4 Pole position. Used Roy equations.

5 Average of the analyses of three data sets in the K-matrix model. Uses the data of BATLEY 08A, HYAMS 73, and GRAYER 74, partially of COHEN 80 or ETKIN 82B.

6 On sheet II in a 2-pole solution. The other pole is found on sheet III at (850–100) MeV

7 Using a relativistic Breit-Wigner function and taking into account the finite D_s mass.

8 Breit-Wigner $\pi\pi$ width. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0} K K / g_{f_0} \pi\pi = 0$.

9 Systematic errors not estimated.

10 Breit-Wigner $\pi\pi$ width. Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $g_{f_0} K K / g_{f_0} \pi\pi = 4.21 \pm 0.25 \pm 0.21$ from ABLIKIM 05.

11 Breit-Wigner, solution 1, PWA ambiguous.

12 K-matrix pole from combined analysis of $\pi^- p \rightarrow \pi^0\pi^0 n$, $\pi^- p \rightarrow K\bar{K} n$, $\pi^+\pi^- \rightarrow \pi^+\pi^-$, $\bar{p}p \rightarrow \pi^0\pi^0\pi^0, \pi^0\eta\eta, \pi^0\pi^0\eta, \pi^+\pi^-\pi^0, K^+K^-\pi^0, K_S^0 K_S^0 \pi^0$, $K^+K_S^0 \pi^-$ at rest, $\bar{p}n \rightarrow \pi^-\pi^+\pi^+$, $K_S^0 K^- \pi^0, K_S^0 K_S^0 \pi^-$ at rest.

13 Using the data of AKHMETSHIN 99c, ACHASOV 00H, and ALOISIO 02D.

14 Breit-Wigner width.

15 Supersedes ACHASOV 98I. Using the model of ACHASOV 89.

16 Supersedes ACHASOV 98I.

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- 17 In the "narrow resonance" approximation.
 18 From the combined fit of the photon spectra in the reactions $e^+ e^- \rightarrow \pi^+ \pi^- \gamma$, $\pi^0 \pi^0 \gamma$.
 19 Supersedes BARBERIS 99 and BARBERIS 99B
 20 T-matrix pole.
 21 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(1039 - 93i)$ MeV.
 22 From invariant mass fit.
 23 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(963 - 29i)$ MeV.
 24 Reanalysis of data from HYAMS 73, GRAYER 74, SRINIVASAN 75, and ROSSELET 77 using the interfering amplitude method.
 25 At high $|t|$.
 26 At low $|t|$.
 27 On sheet II in a 4-pole solution, the other poles are found on sheet III at $(953 - 55i)$ MeV and on sheet IV at $(938 - 35i)$ MeV.
 28 Combined fit of ALDE 95B, ANISOVICH 94.
 29 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(996 - 103i)$ MeV.
 30 From sheet II pole position.
 31 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(797 - 185i)$ MeV and can be interpreted as a shadow pole.
 32 On sheet II in a 2 pole solution. The other pole is found on sheet III at $(978 - 28i)$ MeV.
 33 From coupled channel analysis.
 34 Coupled channel analysis with finite width corrections.
 35 From coupled channel fit to the HYAMS 73 and PROTOPOPESCU 73 data. With a simultaneous fit to the $\pi\pi$ phase-shifts, inelasticity and to the $K_S^0 K_S^0$ invariant mass.
 36 Included in AGUILAR-BENITEZ 78 fit.

$f_0(980)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \pi\pi$	dominant
$\Gamma_2 K\bar{K}$	seen
$\Gamma_3 \gamma\gamma$	seen
$\Gamma_4 e^+ e^-$	

$f_0(980)$ PARTIAL WIDTHS

$\Gamma(\gamma\gamma)$	DOCUMENT ID	TECN	COMMENT	Γ_3
VALUE (keV)				
0.29 $^{+0.07}_{-0.06}$ OUR AVERAGE				
0.286 ± 0.017 $^{+0.211}_{-0.070}$	1 UEHARA 08A	BELL	$10.6 e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$	
0.205 ± 0.095 $^{+0.147}_{-0.083}$ -0.117	2 MORI 07	BELL	$10.6 e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$	
0.28 ± 0.09 -0.13	3 BOGLIONE 99	RVUE	$\gamma\gamma \rightarrow \pi^+ \pi^-$, $\pi^0 \pi^0$	
0.42 ± 0.06 ± 0.18	4 OEST 90	JADE	$e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.16 ± 0.01	5 MENNESSIER 11	RVUE		
0.29 ± 0.21 $^{+0.02}_{-0.07}$	6 MOUSSALLAM11	RVUE	Compilation	
0.42	7.8 PENNINGTON 08	RVUE	Compilation	
0.10	8.9 PENNINGTON 08	RVUE	Compilation	
0.29 ± 0.07 ± 0.12	10.11 BOYER 90	MRK2	$e^+ e^- \rightarrow e^+ e^- \pi^+ \pi^-$	
0.31 ± 0.14 ± 0.09	10.11 MARSISKE 90	CBAL	$e^+ e^- \rightarrow e^+ e^- \pi^0 \pi^0$	
0.63 ± 0.14	12 MORGAN 90	RVUE	$\gamma\gamma \rightarrow \pi^+ \pi^-$, $\pi^0 \pi^0$	

¹ Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $gf_0 K K / gf_0 \pi\pi = 0$.

² Using finite width corrections according to FLATTE 76 and ACHASOV 05, and the ratio $gf_0 K K / gf_0 \pi\pi = 4.21 \pm 0.25 \pm 0.21$ from ABLIKIM 05.

³ Supersedes MORGAN 90.

⁴ OEST 90 quote systematic errors $^{+0.08}_{-0.18}$. We use ± 0.18 . Observed 60 events.

⁵ Uses an analytic K-matrix model. Compilation.

⁶ Using dispersion integral with phase input from Roy equations and data from MARSISKE 90, BOYER 90, BEHREND 92, UEHARA 08A, and MORI 07.

⁷ Solution A (preferred solution based on χ^2 -analysis).

⁸ Dispersion theory based amplitude analysis of BOYER 90, MARSISKE 90, BEHREND 92, and MORI 07.

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9 Solution B (worse than solution A; still acceptable when systematic uncertainties are included).

10 From analysis allowing arbitrary background unconstrained by unitarity.

11 Data included in MORGAN 90, BOGLIONE 99 analyses.

12 From amplitude analysis of BOYER 90 and MARSISKE 90, data corresponds to resonance parameters $m = 989$ MeV, $\Gamma = 61$ MeV.

$\Gamma(e^+e^-)$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT	Γ_4
<8.4	90	VOROBYEV	88	ND	$e^+e^- \rightarrow \pi^0\pi^0$

$f_0(980)$ BRANCHING RATIOS

$\Gamma(\pi\pi)/[\Gamma(\pi\pi) + \Gamma(K\bar{K})]$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_1/(\Gamma_1 + \Gamma_2)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.52 ± 0.12	9.9k	1 AUBERT	060 BABR	$B^\pm \rightarrow K^\pm\pi^\pm\pi^\mp$
0.75 ± 0.11 -0.13		2 ABLIKIM	05Q BES2	$\chi_{c0} \rightarrow 2\pi^+ 2\pi^-$, $\pi^+\pi^- K^+ K^-$
0.84 ± 0.02		3 ANISOVICH	02D SPEC	Combined fit
~0.68		OLLER	99B RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}$
0.67 ± 0.09		4 LOVERRE	80 HBC	$4\pi^- p \rightarrow n2K_S^0$
0.81 ± 0.09 -0.04		4 CASON	78 STRC	$7\pi^- p \rightarrow n2K_S^0$
0.78 ± 0.03		4 WETZEL	76 OSPK	$8.9\pi^- p \rightarrow n2K_S^0$

1 Recalculated by us using $\Gamma(K^+K^-)/\Gamma(\pi^+\pi^-) = 0.69 \pm 0.32$ from AUBERT 060 and isospin relations.

2 Using data from ABLIKIM 04G.

3 From a combined K-matrix analysis of Crystal Barrel (0. $p\bar{p} \rightarrow \pi^0\pi^0\pi^0$, $\pi^0\eta\eta$, $\pi^0\pi^0\eta$), GAMS ($\pi p \rightarrow \pi^0\pi^0n$, $\eta\eta n$, $\eta\eta' n$), and BNL ($\pi p \rightarrow K\bar{K}n$) data.

4 Measure $\pi\pi$ elasticity assuming two resonances coupled to the $\pi\pi$ and $K\bar{K}$ channels only.

$f_0(980)$ REFERENCES

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GARCIA-MAR... 11	PRL 107 072001	R. Garcia-Martin <i>et al.</i>	(MADR, CRAC)
MENNESSIER 11	PL B696 40	G. Mennessier, S. Narison, X.-G. Wang	
MOUSSALLAM 11	EPJ C71 1814	B. Moussallam	
BATLEY 10C	EPJ C70 635	J.R. Batley <i>et al.</i>	(CERN NA48/2 Collab.)
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ECKLUND 09	PR D80 052009	K.M. Ecklund <i>et al.</i>	(CLEO Collab.)
BATLEY 08A	EPJ C54 411	J.R. Batley <i>et al.</i>	(CERN NA48/2 Collab.)
PENNINGTON 08	EPJ C56 1	M.R. Pennington <i>et al.</i>	
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AMBROSINO 07	EPJ C49 473	F. Ambrosino <i>et al.</i>	(KLOE Collab.)
AUBERT 07AK	PR D76 012008	B. Aubert <i>et al.</i>	(BABAR Collab.)
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AMBROSINO 06B	PL B634 148	F. Ambrosino <i>et al.</i>	(KLOE Collab.)
AUBERT 06O	PR D74 032003	B. Aubert <i>et al.</i>	(BABAR Collab.)
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ANISOVICH 02D	PAN 65 1545	V.V. Anisovich <i>et al.</i>	
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Also	PAN 62 405	D. Alde <i>et al.</i>	(GAMS Collab.)
	Translated from YAF 62 446.		

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LOCHER	98	EPJ C4 317	M.P. Locher <i>et al.</i>	(PSI) REFID=46372
ALDE	97	PL B397 350	D.M. Alde <i>et al.</i>	(GAMS Collab.) REFID=45392
BERTIN	97C	PL B408 476	A. Bertin <i>et al.</i>	(OBELIX Collab.) REFID=45701
ISHIDA	96	PTP 95 745	S. Ishida <i>et al.</i>	(TOKY, MIYA, KEK) REFID=45770
TORNQVIST	96	PRL 76 1575	N.A. Tornqvist, M. Roos	(HELS) REFID=44507
ALDE	95B	ZPHY C66 375	D.M. Alde <i>et al.</i>	(GAMS Collab.) REFID=44375
AMSLER	95B	PL B342 433	C. Amsler <i>et al.</i>	(Crystal Barrel Collab.) REFID=44377
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ANISOVICH	95	PL B355 363	V.V. Anisovich <i>et al.</i>	(PNPI, SERP) REFID=44442
JANSSEN	95	PR D52 2690	G. Janssen <i>et al.</i>	(STON, ADLD, JULI) REFID=44508
AMSLER	94D	PL B332 277	C. Amsler <i>et al.</i>	(Crystal Barrel Collab.) REFID=44093
ANISOVICH	94	PL B323 233	V.V. Anisovich <i>et al.</i>	(Crystal Barrel Collab.) REFID=43659
BUGG	94	PR D50 4412	D.V. Bugg <i>et al.</i>	(LOQM) REFID=44078
KAMINSKI	94	PR D50 3145	R. Kaminski, L. Lesniak, J.P. Maillet	(CRAC+) REFID=45771
ZOU	94B	PR D50 591	B.S. Zou, D.V. Bugg	(LOQM) REFID=44072
MORGAN	93	PR D48 1185	D. Morgan, M.R. Pennington	(RAL, DURH) REFID=43614
BEHREND	92	ZPHY C56 381	H.J. Behrend	(CELLO Collab.) REFID=43172
AGUILAR-...	91	ZPHY C50 405	M. Aguilar-Benitez <i>et al.</i>	(LEBC-EHS Collab.) REFID=41637
ARMSTRONG	91	ZPHY C51 351	T.A. Armstrong <i>et al.</i>	(ATHU, BARI, BIRM+) REFID=41744
BOYER	90	PR D42 1350	J. Boyer <i>et al.</i>	(Mark II Collab.) REFID=41362
BREAKSTONE	90	ZPHY C48 569	A.M. Breakstone <i>et al.</i>	(ISU, BGNA, CERN+) REFID=41376
MARSISKE	90	PR D41 3324	H. Marsiske <i>et al.</i>	(Crystal Ball Collab.) REFID=41351
MORGAN	90	ZPHY C48 623	D. Morgan, M.R. Pennington	(RAL, DURH) REFID=41583
OEST	90	ZPHY C47 343	T. Oest <i>et al.</i>	(JADE Collab.) REFID=41358
ACHASOV	89	NP B315 465	N.N. Achasov, V.N. Ivanchenko	 REFID=48021
AUGUSTIN	89	NP B320 1	J.E. Augustin, G. Cosme	(DM2 Collab.) REFID=41004
VOROBYEV	88	SJNP 48 273	P.V. Vorobiev <i>et al.</i>	(NOVO) REFID=41023
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ABACHI	86B	PRL 57 1990	S. Abachi <i>et al.</i>	(PURD, ANL, IND, MICH+) REFID=20394
ETKIN	82B	PR D25 1786	A. Etkin <i>et al.</i>	(BNL, CUNY, TUFTS, VAND) REFID=20390
GIDAL	81	PL 107B 153	G. Gidal <i>et al.</i>	(SLAC, LBL) REFID=20386
ACHASOV	80	SJNP 32 566	N.N. Achasov, S.A. Devyanin, G.N. Shestakov	(NOVM) REFID=20458
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COHEN	80	PR D22 2595	D. Cohen <i>et al.</i>	(ANL) IJP REFID=20381
LOVERRE	80	ZPHY C6 187	P.F. Loverre <i>et al.</i>	(CERN, CDEF, MADR+) IJP REFID=20382
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CASON	78	PRL 41 271	N.M. Cason <i>et al.</i>	(NDAM, ANL) REFID=20370
LEEPER	77	PR D16 2054	R.J. Leeper <i>et al.</i>	(ISU) REFID=20365
ROSSELET	77	PR D15 574	L. Rosselet <i>et al.</i>	(GEVA, SACL) REFID=11004
FLATTE	76	PL 63B 224	S.M. Flatte	(CERN) REFID=20446
WETZEL	76	NP B115 208	W. Wetzel <i>et al.</i>	(ETH, CERN, LOIC) REFID=20362
SRINIVASAN	75	PR D12 681	V. Srinivasan <i>et al.</i>	(NDAM, ANL) REFID=21062
GRAYER	74	NP B75 189	G. Grayer <i>et al.</i>	(CERN, MPIM) REFID=20113
BINNIE	73	PRL 31 1534	D.M. Binnie <i>et al.</i>	(LOIC, SHMP) REFID=20343
GRAYER	73	Tallahassee	G. Grayer <i>et al.</i>	(CERN, MPIM) REFID=20347
HYAMS	73	NP B64 134	B.D. Hyams <i>et al.</i>	(CERN, MPIM) REFID=20107
PROTOPOP...	73	PR D7 1279	S.D. Protopopescu <i>et al.</i>	(LBL) REFID=20108